

R E M A R K S

Claims 1-3, 5 and 8-12 are pending and stand ready for further action on the merits. Claims 4, 6 and 7 have been cancelled. The amendment to claim 1 finds support in cancelled claim 4.

Support for the "workability-improving ingredient" as described in new claims 8 and 9 can be found on page 10, line 6. Support for the "vulcanization accelerator other than the sulphenamide vulcanization accelerator" as described in new claims 8 and 10 can be found on page 10, line 10. Support for the "vulcanizing agent other than sulfur" as described in claim 8 can be found on page 10, line 11. Support for the "cobalt salts of an organic acid" as described in claim 8 can be found on page 10, lines 26-27. Support for new claim 11 can be found in claim 1.

New claim 12 finds support in claims 1 and 4 as originally filed and describes the limitations of new claim 8, which find support in the specification as described above.

No new matter has been added by way of the above-amendment.

Issues Under 35 U.S.C. 103

The following rejections are pending:

a) claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch et al. US 3,038,515 in view of the Exxon technical article ("Bromobutyl Rubber, Compounding and Applications", 1986), Gessler et al. US 4,014,852 and optionally Hous et al. GB 2072576; and

b) claims 1-7 are rejected under 35 U.S.C. 103 as being unpatentable over Koch et al. in view of Berta US 4,616,686 (Berta '686) and Berta US 4,587,302 (Berta '302).

Applicants respectfully traverse each of the rejections, and firmly believe that the above-amendments to the claims patentably distinguish over the cited references.

At page 7, second paragraph of the outstanding Office Action, the Examiner states as follows:

"Although applicant additionally argues that the claim 6 language excludes the presence of silica in the second rubber composition, the relevant language is unchanged from that before the Board of Appeals and the Board of Appeals has already unambiguously determined that silica is not excluded (e.g. page 14 of the decision by the Board of Appeals)." (The Examiner repeats this observation at page 13, first full paragraph).

In response to this statement, Applicants have amended claim 1 to clearly exclude the presence of silica in the second rubber composition by incorporating the transitional phrase "consisting of" in the description of the second rubber composition. Based on this amendment, Applicants respectfully submit that the claims are patentably distinct from the teachings of the cited references. Specifically, Koch et al. teach that poor vulcanized adhesion between an SBR layer and a butyl rubber layer owing to low co-

vulcanizability thereof is improved by adding silica to the SBR layer and chlorinating the butyl rubber. The intermediate rubber layer of Koch et al. is required to contain silica as an essential component. Claim 1 of the present application has been amended to exclude the presence of silica in the diene rubber layer. Therefore, even assuming *arguendo* that the natural rubber/chlorobutyl rubber blend in the inner liner layer of Koch et al. can be replaced with a blend of regular butyl rubber and bromo- or chlorobutyl rubber taught by secondary references, the proposed combination of cited references cannot lead a person skilled in the art to arrive at Applicants' claimed invention.

As the MPEP directs, all the claim limitations must be taught or suggested by the prior art to establish a *prima facie* case of obviousness. See MPEP § 2143.03. Since none of the secondary references (Exxon technical article, Gessler et al., Hous et al. Berta '686 and Berta '302) fairly suggest modifying the intermediate rubber layer of Koch et al. to exclude silica, a *prima facie* case of obviousness over this combination of references cannot be said to exist. As such, withdrawal of both rejections are respectfully requested.

Conclusion

Based upon the above amendments and comments, Applicants respectfully submit that the claims are in condition for allowance. A notice to such effect is earnestly solicited.


Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Garth M. Dahlen, Ph.D., Esq. (Reg. No. 43,575) at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.


Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By

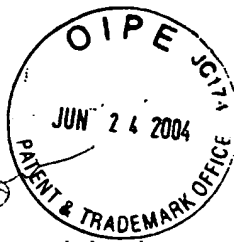

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Attachment: Copy of Opinion from the Board of Appeals

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Appeal to CAFC

1-29-02

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

Paper No. 48

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TAKAFUMI TAGUCHI,
MAMORU UCHIDA and KIYOSHIGE MURAOKA

Appeal No. 1999-0066
Application 08/110,836

HEARD: October 24, 2001

MAILED

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PAT. & T.M. OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

Before WARREN, LIEBERMAN and PAWLIKOWSKI, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

Decision on Appeal

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner finally rejecting claims 1 through 7. Claim 1, as it stands of record,¹ is illustrative of the claims on appeal:

1. A pneumatic tire having a carcass of at least one layer, said carcass having a pair of ends engaged with a pair of bead cores on both sides with each of the ends being turned up outwardly from an inner side around each of the pair of bead cores, an inner liner made of a first rubber composition disposed radially inside of the carcass, and a rubber layer disposed between said carcass and said inner liner;

¹ See the amendment of December 10, 1996 (Paper No. 31).

the rubber component of said first rubber composition consisting essentially of 60 to 95% by weight of a halogenated butyl rubber and 5 to 40% by weight of a regular butyl rubber, said regular butyl rubber being an isobutylene-isoprene copolymer rubber, and

said rubber layer being made of a second rubber composition including a diene rubber, sulfur and a sulfenamide vulcanization accelerator;

the amount of sulfur of said second rubber composition being represented by the equation (I):

$$2 + 0.05A \leq X \leq 5 + 0.05A \quad (I)$$

wherein X is the amount of sulfur in parts per hundred of the diene rubber of said rubber layer and A is the percentage by weight of the regular butyl rubber in the rubber component.

The appealed claims, as represented by claim 1, are drawn to a pneumatic tire wherein the inner three layers are, in order, a so-called "carcass" layer; an intermediate rubber layer being made of a rubber composition including a diene rubber, sulfur in an amount determined by the specified equation, and a sulfenamide vulcanization accelerator; and an inner liner layer having a rubber component consisting essentially of the specified amounts of a halogenated butyl rubber and an isobutylene-isoprene copolymer rubber. In claim 6,² the rubber layer further includes carbon black as a reinforcing ingredient. According to appellants, the pneumatic tire can be "a heavy duty pneumatic tire having an inner liner and a rubber layer located between a carcass and the inner liner, capable of satisfactorily shutting off from air and moisture, which is free from a crack generation problem due to high internal air pressure and due to heat generated while the tire is running" (specification, page 1).

The references relied on by the examiner are:

| | | |
|--|-----------|---------------|
| Koch et al. (Koch) | 3,038,515 | Jun. 12, 1962 |
| Gessler et al. (Gessler) | 4,014,852 | Mar. 29, 1977 |
| Berta (Berta '302) | 4,587,302 | May 6, 1986 |
| Berta (Berta '686) | 4,616,686 | Oct. 14, 1986 |
| Hous et al. (Hous) ³ (published United Kingdom Patent Specification) | 2 072 576 | Oct. 7, 1980 |

² The copy of appealed claim 6 appearing in the appendix to the brief is in error as "equation (I)" should read the same as "equation (I)" appearing in the copy of appealed claim 1. See the amendment of December 10, 1996 (Paper No. 31).

³ This reference was referred to as "Exxon" by the examiner (answer, page 3) and as "Hous '576" by appellants (brief, page 3).

Exxon Chemical Co. (Exxon), Bromobutyl Rubber, Compounding and Applications 7, 8, 53 and 54 (1986).

The examiner has rejected appealed claims 1 through 7 under 35 U.S.C. § 103(a) as being unpatentable over Koch taken with Exxon, Gessler and, optionally, Hous (answer, pages 5-11), and over Koch taken with Berta '686 and Berta '302 (*id.*, pages 11-18).

Appellants, in their brief (page 4), divide the appealed claims into two groups: claims 1 through 5 and claims 6 and 7. Thus, we decide this appeal based on appealed claims 1 and 6. 37 CFR § 1.192(c)(7) (1997).

We affirm both grounds of rejection and thus the decision of the examiner.

Rather than reiterate the respective positions advanced by the examiner and appellants, we refer to the examiner's answer and to appellants' brief for a complete exposition thereof.

Opinion

As an initial matter, we find that, when considered in light of the written description in the specification as interpreted by one of ordinary skill in this art, *see, e.g., In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997), the plain language of appealed claims 1 and 6 specifies "[a] pneumatic tire" wherein the inner three layers are, in order, a so-called "carcass" layer, a rubber layer and an inner liner layer. There is no stated requirement for the compounding ingredients for the "carcass of at least one layer" and thus this layer can be compounded in any manner. The plain language of claims 1 and 6 does require that the inner liner of the claimed pneumatic tire, is a "first rubber composition" that has a "rubber component" that consists essentially of 60 to 95 % by weight of a halogenated butyl rubber and 5 to 40 % by weight of an isobutylene-isoprene copolymer rubber, which limitation defines only the relationship between these two ingredients. We find that the transitional term "consisting essentially of" is intended to have its customary function in claim construction of excluding from the rubber component any ingredients that would adversely affect the basic and novel characteristics of the inner liner layer and thus the claimed pneumatic tire. *See generally, PPG Industries Inc. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1354-57, 48 USPQ2d 1351, 1353-56 (Fed. Cir. 1998); *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976); *Ex parte Boukidis*, 154 USPQ 444 (Bd. App. 1966). Thus, other rubber ingredients can be present in the

"consisting
essentially
of"

compounding composition for the inner liner layer so long as the basic and novel characteristics of the inner liner layer are not materially affected.

However, on this record, it is difficult to determine when the basic and novel characteristics of the inner liner layer would be adversely affected by any additional rubber(s) used to compound the inner liner layer. We observe, in this respect, that the written description of the specification neither describes those rubber component ingredients which would adversely affect the basic and novel characteristics of the inner liner layer nor describes what constitutes a material change in the basic and novel characteristics of the inner liner layer or the pneumatic tire. *See generally, PPG Industries*, 156 F.3d at 1355-57, 48 USPQ2d at 1355-56 (Patentees “could have defined the scope of the phrase ‘consisting essentially of’ for purposes of its patent by making clear in its specification what it regarded as constituting a material change in the basic and novel characteristics of the invention. The question for our decision is whether PPG did so.”). Indeed, the only disclosure of properties in the written description of the specification to be used as guidelines of the purposes here are with respect to properties of “heavy duty pneumatic tires” (specification, e.g., page 1) for which the specification provides no indication of the extent of the “heavy duty” service at which the properties will be evident.

There is also no claim limitation with respect to the other ingredients which can be used in compounding the inner liner layer. Appellants disclose in the specification that the inner liner layer composition can at least contain “other ingredients which are normally included in a conventional rubber composition,” including vulcanization accelerators (paragraph bridging pages 7-8), which would further include sulfur and zinc oxide as well (e.g., page 11, lines 29-37), all of which can affect the basic characteristics of the inner liner depending on the manner employed, even if the rubber component is limited to the two specified rubber ingredients. We find no basis in the claims to limit any additional ingredients to these “other ingredients” listed in the specification or to limit the amounts of the additional ingredients to those exemplified in the specification examples. *See generally, In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); *In re Priest*, 582 F.2d 33, 37, 199 USPQ 11, 15 (CCPA 1978); *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969).

The plain language of appealed claims 1 and 6 further requires that the intermediate rubber layer is prepared from a “rubber composition including” at least the several listed ingredients, which language would open the composition to the addition of any other ingredients since the term “including” has long been held to be an open-ended term synonymous with the open-ended term “comprising.” *See generally, In re Bertsch*, 132 F.2d 1014, 1019, 56 USPQ 379, 384 (CCPA 1942); *cf. In re Baxter*, 656 F.2d 679, 686-87, 210 USPQ 795, 802-03 (CCPA 1981) (“As long as one of the monomers in the reaction is propylene, any other monomer may be present, because the term ‘comprises’ permits the *inclusion* of other steps, elements, or materials.”). Thus, while the intermediate rubber layer composition must contain at least some amount of “diene rubber,” such as a styrene-butadiene rubber or natural rubber (e.g., appealed claims 4 and 7), and some amount of the specified sulfenamide accelerator, the claim language would permit the inclusion of any additional ingredients such as a second diene rubber, any other rubber, other polymers and copolymers, and any other vulcanization accelerator(s) in any amount. We further observe, in this respect, that while the difference between appealed claims 1 and 6 is that claim 6 specifies that the inner liner contains carbon black as “a reinforcing ingredient,” this ingredient can be included in the rubber layer of the claim 1. The amount of sulfur that is present in the rubber layer is determined by the formula specified in appealed claims 1 and 6.

We have carefully reviewed the record and based thereon find ourselves in agreement with the supported position advanced by the examiner (answer, pages 5-11; see also pages 3-4) that, *prima facie*, one of ordinary skill in this art would have found in the combined teachings of Koch, Exxon, Gessler and Hous the reasonable suggestion that the composition of Koch Example II for the inner liner layer can be modified by using bromobutyl rubber and butyl rubber, and that the composition of Koch Example I for the intermediate rubber layer can be compounded with a sulfenamide as the vulcanization “accelerator” and the same or similar amount of sulfur, with the reasonable expectation of obtaining a pneumatic tire which would have the properties taught by the combination of references, thus arriving at then claimed pneumatic tire encompassed by appealed claims 1 and 6, as we have interpreted these claims above. We add the following for emphasis.

We find that Koch teaches that an improved vulcanization bond can be obtained between the rubber layers that contain copolymers of butadiene and styrene, which the reference denominates as GRS rubber polymers (e.g., col. 2, lines 30-33) and are known in the art as SBR copolymers (answer, page 3), and that contain butyl rubber, such as isobutylene-isoprene copolymer, and a conjugated diene rubber (col. 2, lines 27-29), by controlling the allocation of sulfur during vulcanization by adding silica to, *inter alia*, the GRS polymer and chlorinating the butyl rubber (e.g., col. 1, lines 9-61; col. 3, line 44, to col. 4, line 11; and col. 4, lines 21-29 and 49-53). The GRS rubber loaded with silica is in the intermediate layer 8 in the Koch Figure, which corresponds to intermediate rubber layer 11 in application FIG. 1; the chlorinated butyl rubber is in liner 7 in the Koch Figure, which corresponds to inner liner 7 in application FIG. 1; and the carcass layer is portion 2 in the Koch Figure, which corresponds to carcass 2 in application FIG. 1 (Koch, col. 4, lines 12-29; specification, pages 8-10). Koch provides in Example I a compounded GRS rubber composition for the intermediate layer with, *inter alia*, carbon black, silica, zinc oxide, stearic acid, sulfur, and an “[a]ccelerator” (col. 2). The reference further provides in Example II a compounded inner liner composition which contains, *inter alia*, natural rubber, chlorinated butyl rubber, carbon black, stearic acid, zinc oxide, “retarder,” sulfur, mercaptobenzthiazole and tetramethyl thiuram disulfide (col. 3).

In comparing the inner liner and intermediate rubber layer compositions specified in appealed claims 1 and 6 with the corresponding compositions of Koch Examples II and I, respectively, we determine that the ingredients of the composition for each layer disclosed by Koch that we have listed above are encompassed by the corresponding claimed layer even if not specifically listed in appealed claims 1 and 6. We find that the natural rubber is a diene rubber used in the inner liner composition of Koch Example II “to provide building tack” (col. 3, line 24), and that, on this record, this rubber and other such diene rubbers (col. 2, lines 26-29) is not excluded from the “rubber component” of the claimed inner liner composition by the transitional term “consisting essentially of.” The other ingredients, including stearic acid, zinc oxide, “retarder,” sulfur, mercaptobenzthiazole and tetramethyl thiuram disulfide, used in vulcanization, would also be encompassed by the claimed composition. We further determine that the natural rubber and chlorinated butyl rubber in this layer are present in the amount of 20 parts and 80

parts, respectively, which amounts fall within the amounts specified for regular butyl rubber and halogenated butyl rubber in claims 1 and 6. With respect to the intermediate rubber composition of Koch Example I, we find that all of the ingredients, including silica, are encompassed by claimed intermediate rubber layer composition through the open-ended term "including."

It would reasonably appear that the 3 parts of sulfur in the composition of Koch Example I would also fall within the appealed claims if the 20 parts of natural rubber in the inner layer of Koch Example II was used instead of "butyl rubber" as "A" in "equation (I)" of the appealed claims. In any event, Koch would have disclosed to one of ordinary skill in this art that the amount of sulfur used in both the inner liner and the intermediate rubber layer, and the type of "accelerator" used in the intermediate rubber layer is based on the desired rate of vulcanization of the rubber layer, which selections can be made by those of ordinary skill in the art in order to arrive at the desired degree of adhesion between the layers (col. 3., line 44, to col. 4, line 11; and col. 4, lines 49-53).

With respect to the requirement for carbon black as an ingredient in the intermediate rubber layer in appealed claim 6, Koch clearly discloses the use of this ingredient in the intermediate rubber layer of Example I.

Thus, the inner liner and intermediate rubber layer specified in appealed claims 1 and 6 essentially differ from the corresponding layers taught in the Koch Examples in specifying the blend of halogenated butyl rubber and regular butyl rubber in the stated ratio in the composition for the inner liner layer, and in specifying the use of at least some amount of sulfenamide as the vulcanization accelerator in the composition for the intermediate rubber layer.

Exxon teaches that bromobutyl and chlorobutyl are structurally similar, with "many of their properties . . . related to the parent-regular butyl," and provide "stable crosslinks for heat resistant inner-tubes that reduce growth during the more severe operating conditions associated with large commercial vehicles" (pages 7-8). Exxon further teaches that in "100% Halobutyl innerliner for tubeless tyres[,] [b]romobutyl combines the impermeability of the butyl structure to the passage of air and moisture with the highest level of co-curing compatibility and adhesion to commercial tyre carcass substrates," and that "[h]alobutyl [inner] liners maintain higher running inflation pressures . . . thus increasing tyre tread life and durability. For less demanding

requirements, blends with other general purpose elastomers” (page 7). With respect to blends of bromobutyl with natural rubber and with butyl rubber, Exxon discloses (page 53) that

[b]lends of elastomers are formulated to obtain a balance of desired properties for specific applications. Bromobutyl will impart lower gas permeability and improved heat, flex and weather resistance to non-butyl elastomers. Natural rubber in a blend with Bromobutyl improves building tack, elasticity and additional co-cure compatibility toward highly unsaturated rubber substrates.

....

With Bromobutyl-butyl blends, elastomer structures are essentially similar, but the different reactive functionalities provide completely different vulcanization chemistry. In this situation, one should avoid accelerator systems that will rapidly over-cure the halobutyl phase. Recommended cure systems with zinc oxide and stearic acid are:

- Sulphur – 1, MTBS – 1.5 (0.5 pts. or less of a thiuram may be included)
- Sulphur – 1, Santocure NS- 1, TMTDS – 0.25

With respect to the two cure systems listed by Exxon, Gessler discloses that “Santocure” is a tradename for sulfenamides that are known to be “less ‘potent’ accelerators” while “thiuram/thiazole type accelerators” are apparently more active, with “mixed active accelerators . . . represented by” benzothiazyl disulfide and tetraethylthiuram disulfide (col. 5, lines 49-57). Gessler teaches that any of these accelerators can be used with zinc oxide (col. 5, lines 60-65) in vulcanizing blends of conjugated diene butyl rubber and regular butyl or halogenated butyl rubber in compounding compositions for inner liners of pneumatic tires (e.g., col. 3). With respect to the acronyms in Exxon, we observe that appellants discuss the accelerators “‘DM’ (=MBTS=dibenzothiazyl disulfide) and ‘TT’ (=TMTD=tetramethyl thiuram disulfide)” (brief, page 14), from which it would appear that “MBTS” is the “MTBS” of Exxon and that “TMTD” would be a “thiuram” within the use of the term in Exxon.

Thus, it appears on this record, that Exxon in the above quoted passage would have disclosed to one of ordinary skill in this art that appropriate selection can be made between the more active “MTBS,” apparently a dibenzothiazyl disulfide, and included thiuram accelerator, and the less active sulfenamide accelerators in compounding the ingredients for the inner liner to obtain the desired result. We note in this respect that Koch uses a “retarder” with

mercaptobenzthiazole and tetramethyl thiuram disulfide in compounding the inner liner ingredients in Koch Example II.

Exxon further discloses in Table 1 (page 54) six different examples comprising blends of 100 to 50 parts of a bromobutyl to 0 to 50 parts of regular butyl, in 5 and 10 part increments beginning with 20 parts of regular butyl, using the zinc oxide, sulfur and "MBTS" sulfur cure system. Exxon states, *inter alia*, that "[u]p to 30% regular butyl in the blend provides a significant increase in flex resistance and a small benefit in retained elongation after heat aging" (*id.*). We find from the data reported in Table 1 that the best trends in the reported properties occur in the range of 20 to 40 parts of regular butyl.

Hous discloses that adhesion between the unsaturated (diene) rubbers of the carcass, such as natural rubber and styrene/butadiene rubber (page 1, lines 12-14), and the halobutyl inner liner of a tire can be improved by using an intermediate layer between the two, that is a blend of the diene rubber used in the carcass and the halobutyl rubber used in the inner liner, along with other ingredients used in compounding these two rubbers, including "conventional curing additives," in preparing the respective layers (pages 1-2). In Hous Example 1, an inner liner compounding composition "A" containing chlorobutyl, carbon black, stearic acid, sulfur, zinc oxide and "MBTS" is mixed with a carcass compounding composition "B" containing natural rubber, carbon black, stearic acid, zinc oxide, sulfur and "Santacuse MOR" to form an intermediate layer compounding composition "C" for the intermediate layer. In Hous Example 2, bromobutyl is used in place of chlorobutyl in forming compounding composition "A2," which results in intermediate compounding composition "C2," and in Hous Example 3, a bromobutyl containing intermediate layer compounding composition "C₂" is used in the place of the chlorobutyl containing intermediate layer compounding composition of Hous Example 1. On this record, it appears that the "MBTS" and "Santacuse" accelerators are the same as the "MTBS" and "Santocure" accelerators of Exxon.

Thus, on this record, we find that Hous would have disclosed to one of ordinary skill in this art that the less active sulfenamide accelerators can be used in compounding compositions containing diene rubber, including natural rubber and styrene butadiene rubber; that the more active benzothiazyl disulfide accelerators can be used in compounding compositions containing

halogenated butyl rubber; and that compositions containing both diene rubber and halogenated butyl rubber can be accelerated with either sulfenamide and/or benzothiazyl disulfide accelerators. We note in this respect that the carcass compounding composition "B" containing natural rubber in Hous Example 1 is similar to the GRS compounding composition for the intermediate rubber layer in Koch Example I, and the intermediate layer compounding compositions "C," "C2" and "C₂" containing natural rubber and halobutyl in Hous Examples 1-3 are similar to the inner liner compounding composition of Koch Example II in view of the presence of the benzothiazyl disulfide accelerator, the latter being similar in function to the tetramethyl thiuram disulfide used in Koch Example II.

Indeed, we find that the pneumatic tires of Hous Examples 1-3, wherein the inner liner compounding composition "A" contains chlorobutyl and/or bromobutyl, and thus the intermediate rubber compounding compositions "C," "C2" and "C₂" would also contain one or both of these ingredients, differ from the pneumatic tires of appealed claims 1 and 6 solely in that the inner liner is prepared from chlorobutyl or bromobutyl and not the blend of bromobutyl and regular butyl as required for the claimed inner liner layer. We point out in this respect that the intermediate rubber layer in Hous Examples 1-3 would fall within the requirements of the intermediate rubber layer as claimed because they contains some amount of natural rubber, a diene rubber, as well as some amount of a sulfenamide accelerator and the amount of sulfur would fall within the range specified by "equation (I)" when the blends of bromobutyl rubber and regular butyl rubber taught by Exxon are used in place of the chlorobutyl or bromobutyl for the inner liner as suggested in that reference. We further note that Hous appears to suggest that the halobutyl can be "blends of Halobutyl(s) with unsaturated rubbers" (page 2, lines 36-38), which would also have suggested the use of the blend of bromobutyl and regular butyl taught in Exxon. Thus, *prima facie*, one of ordinary skill in this art following the combined teachings of Hous and Exxon would have routinely arrived at the claimed pneumatic tire encompassed by appealed claims 1 and 6.

We determine from the evidence in the combined teachings in Koch, Exxon, Gessler and Hous with respect to the use of the "less active" sulfenamide accelerators with diene rubber containing compounding compositions that also include sulfur, zinc oxide and stearic acid, and

with respect to the use of “less active” sulfenamide accelerators and/or “more potent” benzothiazyl disulfide and/or thiuram disulfide accelerators with compounding compositions containing halo-butyl rubber, with and without diene rubber and/or regular butyl rubber, as well as sulfur, zinc oxide and stearic acid, that one of ordinary skill in this art would have routinely interpreted the term “Accelerator” used in the table of Koch Example I in the intermediate rubber layer composition that contain sulfur, zinc oxide and stearic acid, to include a choice of accelerators known in the art to provide the rate of vulcanization of that composition to obtain the desired properties as taught by Koch (e.g., col. 3, lines 44-50, and col. 4, lines 49-53). Thus, we conclude that, *prima facie*, the combined teachings of the references would have reasonably suggested to one of ordinary skill in this art that a sulfenamide accelerator can be used alone or with other accelerators in the compounding composition of Koch Example I with the expectation of obtaining a compounding composition for an intermediate rubber layer with the adhesion properties taught by the references.

We further determine from the evidence in the combined teachings of the references that, *prima facie*, the teachings would have reasonably suggested to one of ordinary skill in this art that the blend of natural rubber and chlorobutyl rubber in the compounding composition for the inner liner in Koch Example II can be replaced with a blend of regular butyl rubber and bromo- or chlorobutyl rubber with the expectation of obtaining the adhesion and flex resistant properties for the inner liner as taught by the references. The amounts of halobutyl and regular butyl in the blend would have been routinely determined by this person based on the amounts of natural rubber and chlorobutyl in the blend in Koch Example II and the amounts of bromobutyl and regular butyl in the blends in Table 1 of Exxon, which ranges of amounts fall within or overlap the ranges of amounts for halogenated butyl and regular butyl specified in appealed claims 1 and 6.

We still further determine from the evidence in the combined teachings of the references that, *prima facie*, one of ordinary skill in this art would have found therein the suggestion that the amount of sulfur to be employed in the compounding compositions of the Koch Examples as modified above, can be routinely determined from the direction of the amounts of sulfur used in the examples of the references in order to provide the rate of vulcanization of that composition to

obtain the desired properties in the compositions, including the adhesion provided by the intermediate rubber layer as taught by Koch (e.g., col. 3, lines 44-50). Such amounts would be the same as or overlap with the range of amounts of sulfur as specified following “equation (I)” in appealed claims 1 and 6.

Therefore, one of ordinary skill in this art following the combined teachings of the references, *prima facie*, would have routinely arrived at the claimed pneumatic tire encompassed by appealed claims 1 and 6. *See generally, In re Corkill*, 771 F.2d 1496, 1497-1500, 226 USPQ 1005, 1006-08 (Fed. Cir. 1985); *In re Longi*, 759 F.2d 887, 897, 225 USPQ 645, 651-52 (Fed. Cir. 1985); *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980); *In re Skoll*, 523 F.2d 1392, 1397-98, 187 USPQ 481, 484-85 (CCPA 1975); *In re Castner*, 518 F.2d 1234, 1238-39, 186 USPQ 213, 217 (CCPA 1975); *In re Lintner*, 458 F.2d 1013, 1015-16, 173 USPQ 560, 562-63 (CCPA 1972); *In re Lindner*, 457 F.2d 506, 507-08, 173 USPQ 356, 357-58 (CCPA 1972); *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Accordingly, since a *prima facie* case of obviousness has been established over the combined teachings of Koch, Exxon, Gessler and Hous by the examiner, we have again evaluated all of the evidence of obviousness and nonobviousness based on the record as a whole, giving due consideration to the weight of appellants’ arguments and the evidence in the specification and in the Taguchi II declaration.⁴ *See generally, In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Johnson*, 747 F.2d 1456, 1460, 223 USPQ 1260, 1263 (Fed. Cir. 1984); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); *In re Rinehart*, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

We have carefully considered all of appellants’ arguments and the evidence presented in the specification and the Taguchi II declaration as relied on by appellants in the brief with respect to this ground of rejection of appealed claims 1 and 6 (11-12, 13-17, 25-26, and 27-31). We agree with the examiner’s response to appellants’ arguments with respect to the combined teachings of Koch, Exxon, Gessler and Hous (answer, pages 18-24), to which we add the following for emphasis. We observe that the references have been applied in combination, not

⁴ This declaration was executed on December 4, 1996, and submitted on December 10, 1996 (Paper No. 33).

individually, and thus must be considered for what they collectively would have suggested to one of ordinary skill in this art. *In re Keller*, 642 F.2d 413, 425-26, 208 USPQ 871, 881-82 (CCPA 1981). Contrary to appellants' contention that Koch uses only chlorobutyl rubber in the inner liner layer (brief, e.g., pages 14 and 15), it is clear from the disclosure of Koch that the inner liner layer comprises a blend of a halogenated butyl rubber and a diene rubber (e.g., col. 1 and col. 2, lines 26-29) and is exemplified by the use of a natural rubber – chlorobutyl rubber blend in Koch Example II. Exxon discloses that bromobutyl has similar properties to chlorobutyl as well as to regular butyl, including resistance to crack or cut growth, and that blends of bromobutyl and regular butyl can be used in place of blends of natural rubber and bromobutyl in inner liner compounding compositions, and the benefits, including flex resistance to cracking, that are obtained from adjusting the relative amounts of the regular butyl to bromobutyl in the blend. Thus, contrary to appellants' contentions, Exxon clearly provides motivation to interchange the two blends and is not inconsistent with Koch or the present invention because of the focus on one layer of a pneumatic tire.

Furthermore, in view of the combined teachings of the applied references, we cannot subscribe to appellants' arguments that the use of sulfenamide accelerators would not have been suggested by the individual references. As we pointed out above, it is clear that Koch states no requirement for the "accelerator" in the compounding composition for the intermediate rubber layer in Koch Example II, and indeed teaches that one of ordinary skill in this art can select a suitable accelerator. The art clearly recognizes that different accelerators, including sulfenamide, benzothiazyl disulfides and thiuram disulfides, have different activity levels and are used with a variety of rubbers, including diene rubbers, in compounding compositions for various layers as seen from the combined references. Indeed, as we further pointed out above, Hous discloses that a sulfenamide accelerator is used with a compounding composition containing a natural rubber, a diene rubber that the art recognizes to be in the same category as the butadiene/styrene rubber denominated as GRS rubber in Koch, as also seen in Hous, and that a sulfenamide accelerator along with a benzothiazyl disulfide accelerator is used with a compound composition which includes natural rubber and a halobutyl rubber. Therefore, the combined references clearly

demonstrate that one of ordinary skill in this art would have reasonably selected a sulfenamide accelerator for use in Koch Example II.

Appellants' further argument (brief, page 25), made with respect to the requirement for carbon black in the compounding composition for the intermediate rubber layer in appealed claim 6, that Koch requires the presence of silica in the corresponding compounding composition in Koch Example II while claim 6 requires "using carbon black reinforcing filler alone," disregards the use of the open-ended term "including" in defining this compounding composition in the claim. Thus, as we discussed above, the compounding composition for this layer in claim 6 must contain at least the recited ingredients and would include any compounding composition which contains those ingredients and any additional ingredient(s), such as silica.

Turning now to the evidence in the specification and the Taguchi II declaration, it is well settled that the burden of establishing the practical significance of data in the record with respect to unexpected results rests with appellants, which burden is not carried by mere arguments of counsel. *See generally, In re Geisler*, 116 F.3d 1465, 1470, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997); *In re Merck & Co.*, 800 F.2d 1091, 1099, 231 USPQ 375, 381 (Fed. Cir. 1986); *Longi, supra*; *In re Klosak*, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972); *In re D'Ancicco*, 439 F.2d 1244, 1248, 169 USPQ 303, 306 (CCPA 1971). Here, upon carefully considering the evidence in the record in light of the arguments advanced by appellants,⁵ we find that appellants have not carried their burden with respect to establishing that the evidence in the specification and in the Taguchi II declaration demonstrate unexpected results with respect to the combined teachings of Koch, Exxon, Gessler and Hous.

Appellants discuss the evidence in the specification as merely advantages of the claimed pneumatic tires and do not specifically establish how the same applies to Koch, Exxon and/or Hous, *see In re Hoch*, 428 F.2d 1341, 1343-44, 166 USPQ 406, 409 (CCPA 1970) (evidence

⁵ We have not considered any evidence in the specification to a greater extent than appellants have relied thereon in the brief, wherein only the evidence in specification Example 1 and Tables 1-3 have been discussed in the brief. *Cf. In re Baxter Travenol Labs.*, 952 F.2d 388, 392, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991) ("It is not the function of this court to examine the claims in greater detail than argued by appellant, looking for nonobvious distinctions over the prior art.").

must provide an actual comparison of the properties of the claimed compositions with compositions of the references), which appear to us to be the most pertinent references with respect to this evidence, and how the results are unexpected over the teachings of these references (brief, pages 11-12, 14 and 16). With respect to Tables 1-3, there is no comparison with the inner liner layer of Koch Example II which contains a blend of natural rubber and chlorobutyl, and to the extent that the intermediate or adjacent layer is identified with respect to Tables 2 and 3, the same also is not that of Koch Example I which contains silica and styrene-butadiene rubber as the diene rubber. The inner liner layer test piece "G" in Table 1 is similar to that of compound "A2" of Hous Example 2, but the intermediate layer in Tables 2 and 3 is not compound "C2" of Hous Example 2. Thus, there is no reasonably probative side-by-side comparison, directly or indirectly, of a layer or layers as specified in appealed claims 1 and 6 with any prior art applied prior art, except for said inner liner "A2" of Hous. *See generally, Baxter Travenol Labs, supra* ("[W]hen unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared to the closest prior art. [Citation omitted.]"); *In re Burckel*, 592 F.2d 1175, 1179, 201 USPQ 67, 71 (CCPA 1979) (the claimed subject matter must be compared with the closest prior art in a manner which addresses the thrust of the rejection); *In re Blondel*, 499 F.2d 1311, 1317, 182 USPQ 294, 298 (CCPA 1974).

Furthermore, in the absence of evidence or scientific explanation in the record establishing that the results are unexpected, on this record it appears to us that the results reported in specification Tables 1-3 are no more than those reasonably expected by one of ordinary skill in this art from the teachings with respect to the use of a blend of bromobutyl and regular butyl rubber in Table 1 of Exxon (page 54), and that the differences that result from the use of a different accelerator or from different amounts of sulfur merely establish that which one of ordinary skill in the art would have arrived at from routine experimentation as taught in the combined references, particularly Koch, and thus are no more than the expected results which are evidence of obviousness rather than nonobviousness. *See, e.g., In re Gershon*, 372 F.2d 535, 537-39, 152 USPQ 602, 604-05 (CCPA 1967).

Appellants discuss the evidence in the Taguchi II declaration with respect to Koch (brief, page 14). However, appellants do not explain how the evidence constitutes a reasonably probative side-by-side comparison, directly or indirectly, between the claimed pneumatic tire of appealed claims 1 and 6 and that of Koch. Indeed, appellants do not explain how the evidence in declaration Table 1 reflects the claimed invention since the compounding composition for the intermediate or adjacent layer contains the dibenzothiazyl disulfide "MBTS" accelerator which, of course, is not a sulfenamide accelerator which is specified for this layer in appealed claims 1 and 6. In similar manner to the evidence in the specification, we find that the tests reported in declaration Tables 1 and 2 do not involve the inner liner layer of Koch Example II, which contains a blend of natural rubber and chlorobutyl, and the intermediate layer of Koch Example I, which contains silica and styrene-butadiene rubber as the diene rubber, are not tested. With respect to Hous, we find again here that while the first appearing inner liner of declaration Tables 1 and 2 is similar to that of compound "A2" of Hous Example 2, the intermediate layers used in these tests is not compound "C2" of Hous Example 2. We also find no evidence or scientific explanation in the declaration which establishes that the results reported are unexpected and thus, on this record, it again appears to us that the results would have been reasonably expected by one of ordinary skill in this art from the teachings with respect to the use of a blend of bromobutyl and regular butyl rubber in Table 1 of Exxon (page 54) and from routine experimentation with different accelerators and different amounts of sulfur as taught in the combined references, particularly Koch.

Even if the evidence in the specification and in the Taguchi II declaration is found to establish an unexpected, superior advantage on the part of the layers of the pneumatic tire tested, we find that this evidence is not commensurate in scope with the appealed claims because it is not apparent from the evidence that the myriad of other compounding compositions for inner liners and intermediate rubber layers encompassed by appealed claims 1 and 6 (*see above* pp. 3-5) and disclosed by Koch and Hous, which were not tested, would behave in the same manner. *See In re Kulling*, 897 F.2d 1147, 1149-50, 14 USPQ2d 1056, 1058 (Fed. Cir. 1990); *In re Clemens*, 622 F.2d 1029, 1035-36, 206 USPQ 289, 295-96 (CCPA 1980); *In re Greenfield*,

571 F.2d 1185, 1189, 197 USPQ 227, 230 (CCPA 1978); *Lindner*, 457 F.2d at 508, 173 USPQ at 358.

Accordingly, based on our consideration of the totality of the record before us, we have weighed the evidence of obviousness found in the combined teachings of Koch, Exxon, Gessler and Hous with appellants' countervailing evidence of and argument for nonobviousness and conclude that the claimed invention encompassed by appealed claims 1 through 7 would have been obvious as a matter of law under § 103(a).

We have carefully reviewed the record on this appeal and based thereon find ourselves in agreement with the examiner that the claimed pneumatic tire encompassed by appealed claims 1 and 6 would have been obvious over the combined teachings of Koch, Berta '686 and Berta '302 to one of ordinary skill in this art at the time the claimed invention was made.

sketch
2nd
rejection

In comparing the claimed invention encompassed by appealed claims 1 and 6, as we have interpreted these claims above, with the combined teachings of the references, we find that the same essentially differs from the corresponding layers taught in Koch in requiring the blend of halogenated butyl rubber and regular butyl rubber in the stated ratio in the inner liner layer, and in specifying the use of at least some amount of sulfenamide as the vulcanization accelerator in the intermediate rubber layer, as we have discussed (*see above* pp. 5-7).

With respect to the blend of halobutyl and regular butyl rubber in the inner liner, we find that Berta '686 would have taught one of ordinary skill in this art that blends of chlorobutyl and natural rubber, such as used in the inner liner layer of Koch Example II, could be replaced with a blend of chlorobutyl and regular butyl mixed with epihalohydrin rubber in order to provide a compounding composition which includes a sulfur cure system of an accelerator and a zinc oxide promoter, for an inner liner layer for pneumatic tires that has improved properties (e.g. cols. 1-2). Berta '686 discloses that in this mixture, the blend of chlorobutyl to regular butyl constitutes from about 35% to about 85% by weight of the mixture and epihalohydrin rubber constitutes from about 15% to about 65% of the mixture (*id.*). The reference discloses that the compounding composition may contain other ingredients, *inter alia*, polychloroprene rubber, such as chlorinated polyisoprene rubber, in an amount of about 1% to about 10% by weight of the composition.

In Berta '686 Examples 13 and 14, a blend of regular rubber and either chlorobutyl or bromobutyl rubber, in a blend ratio of 50/50, constitutes 75 parts by weight of the compounding composition, and polyepichlorohydrin rubber is 25 parts by weight of the composition, which further include carbon black and a sulfur cure system. In Berta '686 Example 15, a blend of regular rubber and either chlorobutyl rubber, in a blend ratio of 75/25, constitutes 100 parts by weight of the composition, and chlorinated polyisoprene rubber is 10 parts by weight of the composition, which further include carbon black and a sulfur cure system. We note that the amount of chlorinated isoprene rubber in Berta '686 Example 15 complies with the maximum amount specified in the reference (col. 4).

While Berta '686 Example 15 does not include an epihalohydrin rubber ingredient, appellants state in the brief, in this respect, that "chlorinated polyisoprene rubber . . . functions in the same manner as epihalohydrin to serve as a vulcanization promoter" and that "Berta '686 discloses using, as a rubber component, a halogenated butyl rubber or a halogenated/non-halogenated butyl rubber blend in combination with epihalohydrin or chlorinated polyisoprene rubber" (page 18). The examiner does not challenge appellants' statements and thus we consider Berta '686 to have disclosed to one of ordinary skill in this art at least that a blend of halobutyl and regular butyl mixed with chlorinated isoprene rubber or with epihalohydrin rubber can be used in place of a blend of natural rubber and halobutyl rubber in the compounding composition for an inner liner layer, with Berta '686 Example 15 being representative of such teachings.

The examiner further finds that Berta '302 would have disclosed to one of ordinary skill in this art that a blend of halobutyl and regular butyl mixed with, *inter alia*, chlorinated polyisoprene rubber, wherein the blend is about 80% to about 99% of the rubber material and the chlorinated polyisoprene rubber is about 1% to about 20%, can be used in the compounding composition which includes a sulfur cure system containing an accelerator and zinc oxide for an inner liner layer of a pneumatic tire (cols. 1-2). In Berta '302 Examples 1-3, 100 parts of chlorobutyl rubber is mixed with 10 parts, 10 parts and 2 parts, respectively, of chlorinated isoprene rubber, and all compounded with, *inter alia*, carbon black and a sulfur cure system. We point out in this respect that Berta '302 teaches that either halobutyl or a blend of halobutyl and regular butyl is mixed with, *inter alia*, chlorinated polyisoprene rubber (col. 1).

Accordingly, the combined teachings of Koch, Berta '686 and '302, *prima facie*, would have reasonably suggest to one of ordinary skill in this art that compounding composition for an inner liner in Koch Example II can be modified by replacing the blend of natural rubber and chlorobutyl rubber with a mixture of a blend of halobutyl, regular butyl and an epihalohydrin rubber and/or a chlorinated isoprene rubber as suggested by the Berta references, with the reasonable expectation of obtaining an inner liner with the properties taught in the Berta references.

Thus, the dispositive issue is whether such a modification would result in a compounding composition for an inner liner that would be encompassed by appealed claims 1 and 6. We determined above that the claim language "consisting essentially of" used to specify the ingredients in the rubber component of the compounding composition of the inner liner layer in appealed claims 1 and 6 is not defined in appellants' specification with respect to those ingredients that are specifically excluded or by description would adversely affect the basic and novel characteristics of this layer, or would result in certain changes that are considered to be adverse effects on the basic and novel characteristics (*see above* pp 3-4). On this basis, we determine that the modification to the compounding composition of Koch Example II would indeed fall within claims 1 and 6 as the Berta references show that epihalohydrin rubber and chlorinated isoprene rubber are ingredients found in such compositions that contain blends of halobutyl and regular butyl rubber that are present in the claimed compositions.

We are not dissuaded by appellants' contention that evidence in the Taguchi I declaration⁶ establishes that the modified composition would be excluded by the requirements for the inner liner layer in appealed claims 1 and 6 because of the results reported for several tests conducted on inner liners which are said to represent the claimed compositions and "Berta," show that the presence of epihalohydrin rubber or chlorinated isoprene rubber adversely affect the basic and novel characteristics of this layer as claimed (brief, pages 13, 18-19, 22 and 24). In this declaration, compounding compositions for an inner liner containing certain ingredients (page 2) differ in the rubber component which is set forth in Table 1 thereof wherein Example A

⁶ This declaration was executed on January 26, 1996, and submitted on February 19, 1996 (Paper No. 27).

represents the claimed invention and Examples B through E are said to represent "Berta." Appellants state that "comparison Tests 'D' and 'E' . . . are representative of Example 15 of Berta '686" (brief, e.g., page 13). We agree with appellants because the issue here involves whether a mixture of a blend of halobutyl and regular butyl rubber mixed with epihalohydrin rubber and/or chlorinated isoprene rubber would fall within the claims and it is apparent that Examples B and C involve only bromobutyl rubber and Example D and E involve a blend. The sole difference between declaration Example D and Berta '686 Example 15 is that the former involves bromobutyl while the latter involves chlorobutyl, although we note that this reference teaches blends containing bromo- or chlorobutyl as seen in Berta '686 Examples 13 and 14. The ratio of bromobutyl/regular butyl declaration Example A is 70/30 rather than 75/25 as in declaration Example D, but is the same ratio as in declaration Example E. However, we observe that declaration Example E contains 20 parts of chlorinated isoprene rubber while Berta '686 limits the same to 10% of the rubber blend, although Berta '302 teaches that the amount can be up to about 20% by weight.

tests

We further find that several of the tests conducted involve the use of an "adjacent rubber layer" (declaration, page 2). The compounding composition for this layer as stated in the declaration (page 3) contains MBTS as an accelerator which appellants identify as a dibenzothiazyl disulfide and not a sulfenamide as required for the compounding composition for the intermediate rubber layer in claims 1 and 6. We find no evidence or scientific explanation in the record which establishes that the tests conducted with the "adjacent layer" not encompassed by appealed claims 1 and 6 would establish the basic and novel characteristics of the claimed inner liner in declaration Example A or establish that such characteristics are adversely effected in declaration Examples B through E.

Upon weighting the data reported in declaration Table 1 in light of the differences between the compared compositions and the use of an unclaimed "adjacent layer" as discussed above, we must agree with the examiner that the reported performance of the composition of declaration Example D, which appellants recognize as representing Berta '686 Example 15, "is well within the range of acceptable values for the inventive compositions when comparison is made with the cut growth values in Table 1 of the specification" (answer page 25), to which we

tests
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an
adjacent
layer

add that the remaining data reported for this declaration example is also within the range of acceptable values for other properties reported in Table 1 of the specification. We further make the same observation with respect to comparing the results in declaration Table 1 for Examples B, C and E with the results reported in specification Table 1. Indeed, we find no disclosure in the written description in appellants' specification describing the properties which would constitute a material change in the basic and novel characteristics of the inner liner layer or the claimed pneumatic tire.

Thus, on this record, we are not convinced that the difference in performance between declaration Example A and Examples B through E establishes that the latter compositions would adversely affect the basic and novel characteristics of the inner liner layer as claimed in appealed claims 1 and 6. Therefore, compounding compositions for an inner liner containing a mixture of a blend of halobutyl and regular butyl and an epihalohydrin rubber and/or a chlorinated isoprene rubber as taught by Berta '686 and '302, fall within the compositions for inner liner layers encompassed by these claims.

Furthermore, with respect to the requirement of appealed claims 1 and 6 for at least some amount of a sulfenamide accelerator in the intermediate rubber layer, we agree with the examiner (answer, pages 13-14) that, *prima facie*, one of ordinary skill in this art would have routinely used a known accelerator for a sulfur cure system, such as those shown in Berta '686 which include sulfenamide accelerators (col. 1), that would provide the desired properties as the "Accelerator" in Koch Example I and particularly since Koch teaches that this person can make this choice as we have discussed (*see above* pp. 9-10).

Therefore, one of ordinary skill in this art following the combined teachings of Koch and the Berta references, *prima facie*, would have routinely arrived at the claimed pneumatic tire encompassed by appealed claims 1 and 6. *See generally, Corkill, supra; Longi, supra; Kerkhoven, supra; Skoll, supra; Castner, supra; Lintner, supra; Lindner, 457 F.2d at 507-08, 173 USPQ at 357-58; Aller, supra.*

Accordingly, since a *prima facie* case of obviousness has been established over the combined teachings of Koch and the Berta references by the examiner, we have again evaluated all of the evidence of obviousness and nonobviousness based on the record as a whole, giving

due consideration to the weight of appellants' arguments and the evidence in the specification and in the Taguchi II declaration. *See generally, Oetiker, supra; Johnson, supra; Piasecki, supra; Rinehart, supra.*

We have carefully considered all of appellants' arguments and the evidence presented in the specification and the Taguchi I and Taguchi II declarations as relied on by appellants in the brief with respect to this ground of rejection of appealed claims 1 and 6 (pages 11-26). We observe again here, as we did above (p. 12) that the references must be considered for what they collectively would have suggested to one of ordinary skill in this art. We have again considered the evidence in the Taguchi I declaration along with appellants' other arguments with respect to whether a mixture of a blend of halobutyl and regular butyl rubber and epihalohydrin and/or chlorinated isoprene rubber would be excluded from appealed claim and whether one of ordinary skill in the art would have modified the compounding composition for the inner liner of Koch Example II by using this mixture instead of the blend of natural rubber and chlorobutyl rubber used in this example.

We cannot agree with appellants that each of Koch, Berta '686 and '302 teach away from using a blend of halobutyl and regular butyl rubber in the inner liner because each discloses examples which that contains only halobutyl rubber or states a preference for only halobutyl (brief, pages 20-21 and 24). It is clear from the Berta references that a blend of halobutyl and regular butyl can be used, even if not the preferred embodiment, *see generally, In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976) ("The fact that neither of the references expressly discloses asymmetrical dialkyl moieties is not controlling; the question under 35 USC 103 is not merely what the references expressly teach, but what they would have suggested to one of ordinary skill in the art at the time the claimed invention was made."), and such a preference does not lead away from the use of a blend of halobutyl regular butyl. *See In re Gurley*, 27 F.3d 551, 552-53, 31 USPQ2d 1130, 1131-32 (Fed. Cir. 1994). With respect to appellants' contention that Koch and the Berta references fail to recognize the improved cracking resistance and crack growth resistance (brief, e.g., page 16), we point out that Berta '686 would have disclosed that improved properties are obtained when the mixtures taught therein are used in place of a blend containing natural rubber and chlorobutyl rubber in compounding

compositions for inner liner layers such as that of Koch Example II, which is reason enough to make the modification. *See In re Kronig*, 539 F.2d 1300, 1304, 190 USPQ 425, 428, (CCPA 1976) (“[I]t is sufficient here that [the reference] clearly [suggests] doing what appellants have done.”).

We have again considered the evidence in the specification and the Taguchi II declaration with respect to Koch in light of appellants’ arguments. However, we remain of the view with respect to this evidence that we expressed above (pp. 14-16). We further find that there is no comparison in the specification or the Taguchi II declaration which reflects the thrust of the present ground of rejection, that is, modifying the composition for the inner liner in Koch Example II by replacing the blend of rubbers therein with a mixture as suggested by the Berta references. *See Burckel, supra*. Furthermore, to the extent that appellants contend that the evidence in the Taguchi I declaration based on Example A and the “Berta” Examples establishes unobvious results in favor of the claimed pneumatic tire, we again point out that a number of tests reported in Table 1 were conducted with an “adjacent layer” which does not fall within the compounding compositions for the intermediate rubber layer specified in appealed claims 1 and 6. *See Burckel, supra*. In any event, appellants have not submitted any evidence or provided a scientific explanation establishing the practical significance of such data in Table 1 of the Taguchi I declaration with respect to unobvious results. *See generally, Geisler, supra; Merck & Co., supra; Longi, supra; Klosak, supra; D’Ancicco, supra*. Indeed, as we found above, the results reported for the Examples in the Taguchi I declaration fall within the range of results reported for the same tests in specification Table 1. Such limited evidence is not commensurate in scope with appealed claims 1 and 6 with respect to this ground of rejection. *See Kulling, supra; Clemens, supra; Greenfield, supra; Lindner*, 457 F.2d at 508, 173 USPQ at 358.

Finally, we also remain of the view expressed above (pp. 13-14), that contrary to appellants’ arguments, appealed claim 6 encompasses a compounding composition for an intermediate rubber layer that contains silica in the manner of Koch Example I.

Accordingly, based on our consideration of the totality of the record before us, we have weighed the evidence of obviousness found in the combined teachings of Koch, Berta ‘686 and Berta ‘302 with appellants’ countervailing evidence of and argument for nonobviousness and


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conclude that the claimed invention encompassed by appealed claims 1 through 7 would have been obvious as a matter of law under § 103(a).


The examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED


 CHARLES F. WARREN)
 Administrative Patent Judge)


 PAUL LIEBERMAN)
 Administrative Patent Judge)


 BEVERLY A. PAWLIKOWSKI)
 Administrative Patent Judge)

) BOARD OF PATENT
) APPEALS AND
) INTERFERENCES
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